Natural Sciences 102 -- Spring 2004
Exam #1 April 22, 2004

Name:

My Laboratory/Discussion TA is (please circle one)

1. Brian Wilhite
2. Jim Chisholm
3. Justin Johnson
4. Anibal Medina
5. Vasileios Paschalides
6. Sein Ahn
7. Don't know

1 (5)	2 (20)	3 (10)	4 (10)	5 (10)	6 (10)	7 (10)	Total (75)

General instructions:

- For essay and descriptive questions, please be complete, but concise. Answers should be limited to the space provided under the question.
- For this exam calculators are not necessary and will not be allowed.
- Values of the various problems are indicated.

I. Hypothesis: [5pts]

Contrast the modern use of the word "hypothesis" [a proposition or theory assumed as a basis for reasoning, argument, or investigation] with how the word was originally used in astronomy.

II. The Two Chief World Systems: [20pts]

Question	Copernican	Ptolemaic
Illustrate the arrangement of the model by means of a diagram.		
Cosmological models are part of a larger intellectual framework. Describe the factors (physics, philosophy, etc.) that influenced the development of the models.		
What were the distinguishing characteristics of the model?		

III. Epicycles [10pts]:

a) [4pts] What is an epicycle? A drawing would be useful.

b) [4pts] Describe the problem that led to the introduction of epicycles? Explain how epicycles were able to solve the problem.

c) [2pts] Which of the following cosmological models had epicycles?

i. Ptolemaic
ii. Copernican
iii. Keplerian

IV. **Kepler's Laws:** [10pts]

a) [5pts] List **and describe** Kepler's Three Laws of Planetary Motion. (It is not necessary that you have the correct numbering; *i.e.,* I just want the three laws, I don't care which is First, Second, or Third.)

b) [5pts] Explain how each of Kepler's laws was a departure from the commonly accepted thought at the time of Kepler.

V. <u>The Telescope:</u> [10 pts]

a) [5pts] Describe two of Galileo's telescope discoveries that were important in developing his cosmological view.

b) [5pts] For each discovery you chose, please explain why the discovery was important for the development of cosmology.

VI. <u>Galileo:</u> [10pts]

a) [5pts] Describe Galileo's approach to science and how it differed from the standard approach of his time.

b) [5pts] Give an example of a primary effect and a secondary effect for
   i. Galileo's experiments with falling bodies
   ii. Galileo's theory of the tides

VII. Dinner: [10pts]

a) [5pts] Of the astronomers we have studied, which one would you most like to have dinner with, and why?

b) [5pts] Of the astronomers we have studied, which one would you least like to have dinner with, and why?